White Paper: Policy Summary and Flaw Analysis

Bay Delta Conservation Plan

Prepared for: Local Agencies of the North Delta

BSK Associates
Engineers & Laboratories

Prepared By Erik Ringelberg, BSK Ecological Services Group Manager

12/18/2012

Introduction

The following white paper is one of a series of reports provided to the Bay Delta Conservation Plan over the past four years for northern Sacramento River Delta reclamation districts, Local Agencies of the North Delta (LAND), now a coalition of fourteen water and reclamation districts. This white paper is intended to document the current version of the plan and some of the recent history that has lead up to the Bay Delta Conservation Plan (BDCP). This paper also identifies flaws in underlying theory and proposed application of the BDCP. These flaws are likely to lead to significant waste of public and private funds, time and social capital, and make the potential for reaching the BDCP's goals uncertain at best.

As local stakeholders and other interested parties await the long-delayed release of the complete Draft BDCP Plan and its associated environmental documentation, it is useful for all parties to take a step back and assess, how did we get here and will this path lead us to and substantive solutions? What are the obvious flaws and their potential solutions, and how will we move California forward into an uncertain water and ecological resources future?

What is the BDCP?

The BDCP is the latest iteration of a statewide water conveyance strategy from the Sacramento-San Joaquin Delta (Delta) to the San Joaquin Valley, and portions of Southern California and the Bay Area, developed under the first Brown administration in 1975 and later the Schwarzenegger administration. The BDCP is again being promoted by Governor Brown, along with the California Department of Water Resources (DWR), and the U.S. Bureau of Reclamation (BOR). However, this process is largely directed by, and for the benefit of the state and federal water contractors who export the water out of the Delta.

This proposal for a peripheral canal around the Delta was originally defeated in a voter referendum in 1982 by an unusual coalition of interests including the agricultural magnate J.G. Boswell and the powerful San Francisco environmental lobby. The problems that drove the original proposal, a lack of predictable water supply due to California's naturally highly variable weather and a massive population in the southern deserts, still exist today. The demand from over 20 million residents in the desert south remains and is likely to increase because of continued land development, contamination of the most accessible shallow aquifers, and the limited remaining potential development of new fresh water sources. Agricultural demands continue in the southern desert valleys that have already captured their own local water supplies, drained the state's largest interior freshwater lake, depleted their groundwater, and who now require new water to dilute the accumulated salts. Pressure on existing water supplies have also come from steep declines in multiple fish species populations, which have eventually lead to further judicial and regulatory restrictions in water pumping from the Delta.

The original peripheral canal proposal, and its new alternative, the peripheral tunnel, is again being promoted this time with the support of some of the agricultural interests and some of the same environmental groups who originally opposed it. That proposal is now being couched as a joint federal Habitat Conservation Plan (HCP) and California Natural Community Conservation Plan (NCCP), essentially programs that are intended to allow for "take" permits to complete the massive water intake projects. The take permits are legal authority under the State and federal Endangered Species Act to "take" kill or otherwise harm (or harass under the federal definition) a

limited number of protected species. In exchange, that harm to the environment is supposed to be balanced by substantial environmental benefits leading to a species' recovery. In an environmental permitting context, the proposed water diversions would be analyzed and permitted under the BDCP and could move forward immediately, but the environmental programs to create new habitat would be deferred into the future on a 50-year schedule, and each would require their own specific analysis at that time. This proposal effectively separates the project from its mitigation, and defers environmental considerations to some future process.

On a small scale, typically at the county level, HCPs are valuable and effective tools that provide the ability to expand communities and plan developments, while protecting the environment. The proposed BDCP instead would arguably be the largest public works project in California, which concentrates all of its impacts on a few communities, and transfers all of the benefits several hundred miles away. For example, the legal Delta is already approximately 43% in public or non-profit ownership for the purposes of habitat, and the BDCP proposes to take an additional 25% of the remaining land (up to approximately 120,000 acres) from highly productive, sustainable agriculture. BDCP further proposes to divert half or more of the flow of the Sacramento River at certain times, based on its current operational criteria.

Scientific analyses by state and federal agencies, as well as the National Academy of Sciences (NAS), the Delta Stewardship Council's Independent Science Board (ISB), and the BDCP's own Independent Science Advisors (ISA), have each identified significant problems in the underlying concepts of the project, the likely outcomes of the project, and the ability to implement the project in a changing environment. Local affected communities, farming interests, environmental groups, and political representatives have also identified significant problems with the project, including the lack of supporting technical and scientific evidence for its potential effectiveness, increasing salinity of the Delta, and other potential fatal flaws, there still has not been any significant balancing or mitigation in its proposed design, or locations.

On July 25, 2012, because of highly critical comments from the State and Federal fish management agency scientists, the total number of intakes for the proposed project (the "preferred alternative") were reduced from 5 to 3. This change was largely symbolic due to the BDCP's own analyses that showed that two of the original 5 intakes would rarely operate due to the massive volumes of water taken from the first three intakes and the limited water typically available in the Sacramento River.

The BDCP should be re-conceptualized to meet existing environmental laws, minimize local impacts, and achieve cost-effective benefits to its recipients. The key flaws from a local landowner and Special District perspective include:

- No local benefits
- 10+ years of construction impacts on local communities
- Increasing local regulatory burden
- No "take" coverage available to local agencies or landowners for species induced by project
- Decreased water quality for local uses
- Conversion of productive farmland to infrastructure and habitat

Given the massive physical and time scale of the project and the associated costs, and risks of stranded infrastructure, the BDCP should be re -conceptualized to minimize environmental impacts, minimize costs, and minimize risk. Some examples of this could include:

- Smaller forebay footprint
- Reduced diversion capacity
- Undergrounding of new power lines
- Optimized, smaller intakes
- Relocation of proposed intakes above American River and below Walnut Grove
- Hydrodynamic redirection in Central Delta through boat -friendly operable gates and fish barriers
- Single, more robust tunnel
- Big-gulp, high-flow prioritization
- In-/South-of-Delta Storage
- "Other Stressor" prioritization for Years 1-10

Each of these flaws and each of the potential project improvements have been brought formally to the BDCP through over four years of public engagement, yet none of these has been addressed or even carefully considered. Even requests to complete a basic optimization of the proposed projec t have been ignored.

Co-Equal?

According to the project proponents:

> "The Bay Delta Conservation Plan is designed to achieve the co -equal goals of providing for the conservation and management of aquatic and terrestrial species, including the restoration and enhancement of ecological functions in the Delta, and improving current water supplies and the reliability of delivery of water supplies conveyed through the State Water Project (SWP) and the Central Valley Project (CVP)." [1]

Over the last four years, participants and observers have identified what appeared to be confusion regarding the plan's purpose and direction, inconsistencies in the analysis, and problems with the plan's technical feasibility. The confusion, inconsistencies, and problems lead to many discussions in the Schwarzenegger administration Steering Committee meetings, numerous questions and comments to the BDCP's environmental consultants; and, later under the second Brown administration, questions directed to the Natural Resources Agenc y and the new management committee.

In their simplest form, the questions largely stem from on the BDCP's premise that exporting half of the Sacramento River flow out of the watershed would "help" or "save" the Delta. The proposed 9,000-15,000 cfs export flow and the creation of a massive new intake infrastructure in the Northern Delta would have large-scale immediate and long -term negative effects on the existing aquatic and terrestrial ecosystems, while the hoped-for ecological benefits in other parts of the Delta are simply inferred; and even those activities are deferred to uncertain future phases

[1] http://baydeltaconservationplan.com/Home.aspx

well after the exports have occurred. This appears to be hardly a co-equal application of project benefits and impacts, and certainly not balanced water supply reliability with ecosystem conservation and management.

Initially, the BDCP co-equal goals may appear reasonable. Portions of Southern California, the San Joaquin Valley, and the San Francisco Bay area are reliant on water from the Delta to some degree because they have already fully developed their own local water supplies, and a significant decline in fish species (pelagic organism decline [POD]) resulted in various court orders to protect those species (often through water export restrictions). However, the BDCP and its associated planning process to achieve those co-equal goals go far beyond any reasonable balancing of interests. The BDCP has minimal scientific foundation, exceptionally high costs, and limited reliability. Meanwhile, the need for secure water supplies, to the extent that is possible, and the need to protect species that are at risk of extinction, are both compelling social and legal issues that require carefully balanced solutions.

Justifying the Pre-determined Plan

Part of the scientific, logic, and procedural problems with the BDCP are directly caused by the pre-determination that the project of what the project would include in 2007-2008:

1. a series of 3 to 5 intakes, each 20 times greater than the next biggest intake in the upper watershed,
2. a massive canal (or tunnels) crossing several major rivers on its way to the existing southern Delta project pumps,
3. the ability to export a total of up to 15,000 cfs (equal to the South Delta pumping facility capacity for the canals) from intakes concentrated in one reach of the Sacramento River without regard to the resulting ecological and downstream water quality effects, and
4. an annual capacity over five and a half million acre feet of water from the Sacramento River just below the City of Sacramento, before that water can flow through the Delta's complex system of waterways. That is the equivalent amount of water to cover an area equal to massive LA County two feet deep.

After development of the diversion scheme, the ecological justifications for building that infrastructure were created later in the process. Only then a scheme for "improving" the Delta's aquatic habitats for a listed fish, the Delta smelt, was presented. Almost a year later, a broad concept for protecting terrestrial resources such as plants, animals and birds was developed.

Amazingly, the scale of the conveyance elements of the BDCP were defined over 5 years ago prior to any threshold analysis to examine the relative benefits and impacts associated with these project elements. Neither the water volume nor the habitat potential was optimized in a way to see what would provide the greatest certainty in all (or drought) water years and was only based on the maximum flow the southern canals would allow. What exactly are the habitat values and the locations needed to protect and recover listed species? They are not defined. Yet, the proposed new intakes are the primary project "Conservation Measure," as defined in the BDCP.

It is appropriate to set upper and lower flow or acreage bounds to help define the CEQA and NEPA analyses, however a sensitivity analysis is also needed for each measure to determine under what conditions the measure benefits or does not benefit a given species . That process is how the effectiveness of the conservation measure is determined, and provides the foundation for determining if a proposed conservation measure should be retained, discarded or modified. That analysis is supposed to happen before the alternative is selected. Instead, the " conservation measure", the North Delta intakes (CM1) was selected and now the BDCP struggles to find the technical justifications for that measure.

If CM 1 was a conservation measure, the BDCP would have identified if the particular thresholds of flow and annual volume that might have been more effective or less effective for conservation of individual fish species . In one instance, for the Schwartzenegger Steering Committee, the modeling staff and fisheries consultant did iden tify an optimization for inta ke locations . That analysis showed that one intake above the American River and one near Walnut Grove provide the best minimization of impacts to listed anadromous fish, and arguably for terrestrial wildlife. These were not the best locations for species conservation, just the least impacts. That alternative was not even included in the CEQA analysis.

An added and critical problem is that the purported ecological benefits from the BDCP to listed fish are unclear at best, particularly given that the food ch ain on which the fish depend on has almost entirely changed due to invasive clams (reduced phytoplankton), and the direct loss of certain high-value fish food species (zooplankton). The BDCP does not address these fundamental aquatic ecosystem drivers, ins tead offering the creation of additional aquatic habitat in speculation of long-term benefits. The BDCP does not explain h ow that habitat linked to creating the specific habitat and food resources needed by the fish species in the right place, at the right time. The BDCP does not explain h ow the very clams and invasive zooplankton that helped precipitate the fish declines will simply not use up any new resources . That analysis and planning is deferred to some undisclosed future date. The BDCP does not expla in h ow the project will avoid river temperature changes from CM1 diversions and the associated riparian habitat fragmentation from the facilities, and provides no near -term measures to address climate change impacts. The only answer provided by the BDCP is that these and other obvious issues will be solved by future generations with adaptive management.

Even that habitat plan, however, is being reviewed on a strictly programmatic level, and will need significant further review and analysis before it can be implemented. Meanwhile the diversion, storage, and conveyance portion of the project will purportedly by ready to implement once the permits are issued. This sequencing indicates that the water reliability is actually more "co-equal" than the habitat impr ovements. Indeed, the standard project mitigation for the loss of the existing riparian and terrestrial habitat for the construction of the 3-5 intakes, two roughly two mile-square storage areas, and the canal[2] appears to be conflated into some "public benefit-public" value to the taxpayer. Thus the taxpayer may pay three times for the BDCP, once for the exceptionally expensive water delivered from the project ($ 12-20+B); then the additional cost of bond interest

[2] A tunnel or pair of tunnels that would replace the aboveground portions of the project, the canal, had originally been proposed and supported by some landowners and terrestrial habitat advocates, since it has fewer aboveground effects. Various cost projections differ as to the economic cost of either major alternative, largely it seems by not including mitigation endowments or other secured funding for the HCP-NCCP.

payments; and, finally for the purported habitat benefits that largely function as indirect mitigation for the conveyance project.

Core Project Defects

Fatal Flaw 1. HCP-NCCP Not Community Based and Damages Last Core-Habitat
HCPs are ordinarily developed by landowners and/or local governments planning to complete a specific project on their land, or to allow a class of similar activities over a large area, which is likely to result in take [3] of listed species. In this case, the existing unscreened south Delta intakes currently "take" listed species, and the proposed project construction and the new project operations are also expected to "take" listed species.

Further, the BDCP failed to follow California's NCCP's 2003 summary of "lessons learned" including:

- Involve All Affected Parties
- Anticipate all interests that may be affected
- Bring them in early, before any commitments are made
- Create an atmosphere of trust
- Foster "ownership" in the process by local interests
- Local land use authorities (cities, counties) must be involved

In the case of the BDCP, in a re-interpretation of HCPs by DWR and BOR, most of the land proposed for BDCP's activities is owned by private individuals who have had no *decision making* role in the development of the HCP or proposed role for its governance. These same lands are also within the planning area of the 5 existing or proposed HCPs within each of the 5 Delta Counties. According to the November 2010 Working Draft of the BDCP, only approximately 6% of the acreage identified for habitat creation is available on publicly owned lands. Similarly under the NCCP, the very first step in the process is a planning agreement: "Planning agreements are developed with interested jurisdictions, landowners and other interested parties. [4]" The interested affected jurisdictions, namely counties and water/reclamation districts were not part of the 2006 Planning Agreement, nor were any landowners.

This HCP-NCCP is also unique in that it explicitly destroys key "core habitat" for State and Federally Listed Species such as Cranes, a host of raptors, as well as Sensitive Natural Communities such as riparian habitat and vernal wetlands. Core habitats should be protected as reserves or refugia for these species, not receiving areas for focused impacts. Under the fundamental criteria for habitat conservation, the Stone Lakes and Yolo Bypass core areas should be built upon, not fragmented by the direct impacts of massive new pumping and storage facilities.

The BDCP process has failed to follow the most basic planning procedures used in HCPs and NCCPs. DWR and BOR must revisit and commit to the standard HCP-NCCP process and learn

[3] Federal Endangered Species Act defines take as: harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect any threatened or endangered species.
[4] http://www.nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=6432

from the challenges that this project has run into already, and be informed by the lessons already well-understood from other planning processes, such as the Chesapeake and Everglade restoration processes. As stated earlier the needs for an effective set of solutions to address water reliability and extinction risk are needed. An effective process is also much likelier to achieve a financially, politically and socially sustainable outcome.

Fatal Flaw 2. Lack of Scientific Foundation

In addition to re-visiting the planning and process elements of how to complete a plan, the BDCP needs to examine the scientific foundation of the establishment of a HCP-NCCP.[6] The HCP-NCCP recovery standard and the requirement to use the "best available" science are intended to ensure that a project proponent cannot simply drive a species (or several species) into extirpation or extinction. Any project that proposes to move forward on a project without fully developing and permitting each the elements that make it a HCP-NCCP is not scientifically or legally defensible.

A well-established and logical path for establishing a habitat or species improvement plan is to assess what the ecological needs for the species are, assess and weight the likely reasons for the apparent species or habitat decline, and then and only then identify which of those threats can be managed for in a series of conservation measures. The following schematic describes this process in its crudest form:

Identify problem(s) > Assess potential means for improvement(s) > Develop conservation measure(s) > Re-assess

This may appear to be overly simplistic (and it is), but it is the logical foundation for recovery plans. Here, the BDCP devised a proposed project, and then attempted to create ecological justifications for the project, and further conflated its *project* mitigation into the plan as conservation measures. The "Options Evaluation" process by which new isolated conveyance was selected in 2008 does not by any stretch of the imagination follow this logical approach. (See http://baydeltaconservationplan.com/BDCPPlanningProcess/BackgroundDocuments/OptionsEvaluationReport.aspx; see also http://baydeltaconservationplan.com/Libraries/Background_Documents/Executive_Summary.sflb.ashx, pp. ES-12 to ES-13 (summarizing results of limited "four dot" analysis).)

The BDCP's overt assertion that the proposed project is the solution to the Delta's problems, while underemphasizing impacts of current Project operations, and ignoring the need to *avoid* and *minimize* impacts of the proposed project, was evident from the very beginning of BDCP process. The afterthought of the protection of terrestrial species is evident throughout the last year of analysis, and all of the detailed measures (including the Effects Analysis) still focus on the listed fish species that limit full use of the existing south Delta project intakes.

To summarize, the only legitimate analysis for an HCP-NCCP from a scientific perspective is one that considers the individual species' needs, the population dynamics, the expected habitat trajectories; and then determines through careful analysis of the multiple variables, which conservation measures implemented in what fashion, over what period, and where on the landscape, can actually increase (by some conservative amount) the species viability. The purported "iterative nature" of this planning process, while accurate in a technical sense, is in fact

currently being used by BDCP proponents to conflate the origins of the "conservation measure," arguing that the proposed project somehow didn't come first.

This intake first perspective is clearly shown in the Plan: The BDCP Environmental Impact Report (EIR) is specifically intended to provide only programmatic (broad) coverage under the California Environmental Act (CEQA) for the "habitat" and project-level coverage for the water diversion and conveyance. The project has coverage, the habitat does not.

EFFECTS ANALYSIS- February 2012 Version

I. Introduction

The Effects Analysis is the first major work product of the BDCP under the current administration. The analysis was focused on aquatic listed fish species, and should be retitled to "Aquatic Effects Analysis." The Effects Analysis was also provided to a new panel of scientific advisors for review. The BDCP's independent scientific advisory panels have repeatedly provided a clear set of analyses and consistent framework to assess potential project data gaps and logic challenges. The BDCP also has had a series of recommendations from its Independent Science Advisors (ISA), the National Academy of Sciences - National Research Council, and recommendations made by Dr. Dahm, scientific advisor to the Delta Stewardship Council (DSC), the vast majority of which have gone unacknowledged. Various other technical experts have also provided technical comments directly to the BDCP, and no formal response to these comments has yet been provided. This lack of response is consistent with the BDCP's defective scientific and public comment process. The scientific process demands technical responses to scientific considerations, which is the purpose of the standard, to identify and use the best available science, not ignore countervailing scientific citations and rely on non-scientific justifications.

In addition to essentially ignoring stakeholder scientific concerns, the BDCP has still not discernibly taken into account public stakeholder comments. The public participation process has no credibility or value to the participants if comments have no disposition. Indeed, public comments have been routinely "lost" and not posted to the primary BDCP website. For the December 2012 version of the Effects Analysis, it is hoped that the preceding comments already provided to the BDCP will be addressed systematically and with transparency. The following comments are intended to provide more clarity on other identified errors or fatal flaws.

II. Specific Comments on the Effects Analysis- Appendix A

The Effects Analysis was again replete with the project confusion described earlier, specifically the confusion about what is the project (or the portion of the project) that will conserve listed fish, and what is mitigation for that project. The habitat creation described by the BDCP could potentially mitigate for the habitat destroyed by the proposed project (including both conveyance facilities and habitat creation). The fact that the BDCP on its own analysis appears to cause significant "take," even despite the provision of mitigation, is evidence that the proposed project (conveyance and its project mitigation/ habitat creation) are not in fact conservation measures as defined in the ESA.

The Plan's focus on taking the Sacramento water upstream of its current intakes is reliant on the premise that Delta fish don't need that cleaner wa ter, that the biological impacts from the loss of the river habitat, water quality and flow will be made up from the reduced loss of the fish drawn to the current pumps. The brackish water t hat the Projects don't want from the Bay will simply replace that lost flow in the river up to sea level. However , that premise (unsupported as it is) falls apart with dual-conveyance, since the Project's South Delta pumps will still run and still take fis h, and we have then also lost the Sacramento habitat quality.

The code for this logical problem is "flow," essentially water that flows through the system out to the Bay. The exact mechanisms for the relationships between flow and habitat area, productiv ity, water opacity for Delta smelt, nutrients, residence time, and a whole host of other factors vary in space and by water year. However, that loss of flow from the historic projects, and from the proposed BDCP, has direct and indirect effects on the very fish the Plan purports to protect.

Notwithstanding the complex biological, legal, economic, social and political implications of flow, it is obvious to most biological scientists and local residents that BDCP's highest likelihood of improving conditions for listed fish and improving overall habitat conditions lay with the measures given the least analysis: those addressing invasive plants and animals. In large part, the loss of habitat quality is related to invasive species and/or species that have been promoted by virtue of landscape changes, such as changes in food chains (particularly zooplankton "quality," clams removing nutrients, cowbird nest parasitism, and the more obvious domination by invasive plants in both the waterways and the land. The BDCP can lead to concerted scientific management of these challenges that are critical to the Delta today, and these and new species that will confound any attempt to improve conditions or succeed with the created habitat.

The effects an alysis also br ings to the forefront the need to further refine and validate the various models that are used to complete the analyses (A7). Despite hundreds of millions of dollars invested in research in the Delta and associated model development, there is very little to show in terms of how to apply that understanding, namely how much does each variable individually, in concert, and over what time frame influence the survival outcomes for targeted species ? This is crucial to moving the BDCP process forward, and critical to the s uccess of any project success . If the BDCP cannot address these fundamental questions in a scientifically supported manner it cannot be considered a conservation plan. Transparent, effective models lead to common understandings, and sometimes, creative solutions.

In the broadest sense, the BDCP's public presentations of the various model runs give the appearance of substance without providing any. For example what are the logical rationale in terms of differentiation between the alternatives, was the least environmentally harmful alternative assessed or is it simply bounding the range of alternatives? Where are the assumptions for the model runs? What is the degree of accuracy or precision of the analysis , or what is the sensitivity of the analysis. What ecological thresholds were discovered during the modeling? How many acres of restored areas of tidal marsh will be put into place , when, and how will that alter the tidal range when and where?

In addition, this dart-throwing process of looking at select averages and whole years, and showing some graphs of postulated outcomes , is not a substitute for a directed scientific investigation that

is specifically intended to provide key decision points for the Plan and its eventual adaptive management. The models at best look back into time by using particular historic water years; adaptive management needs to make decisions looking forward into uncertainty (A8).

Adaptive management is not supposed to be a substitute for knowledge or understanding or the failure to collect critical information in advance of an action: "Adaptive management of the BDCP will refine and test those expectations require monitoring, research and management experiments designed to test and refine the working hypothesis posed by the BDCP and allow the region to navigate through an uncertain future (Lee 1993)" [*sic*] The project cannot as it proposes, defer understanding of the potential and likely effects of the project and the conservation measures until the impacts occur at some point in the future.

The Relationship to Other Plans and Policies (A-11) fails to even identify the 5 other existing or proposed HCP-NCCPs, any County General Plans or policies, or any Federal species recovery plans. The same level of detail is missing from the Pelagic Organism Decline (POD), namely "cherry picking" citations[5] that do not identify the projects as a potential source of the POD, and even using citations that were roundly discredited in the National Academy of Sciences presentations (A-16).

Given that the sharp species decline occurred over a century after levees were built in the Delta, and decades after the wastewater treatment plants were commissioned, recent habitat decline and wastewater treatment appear minor factors in the POD, yet the BDCP focuses on those issues and not assessing and mitigating the relative impacts from the projects that comprise the BDCP. Indeed, land use is cited as a factor (A-17, A-21) although land use in the primary Delta has remained static for decades. What has changed includes invasive species, including zooplankton and clams, and the volume of Delta exports to Southern California during the POD. The continued use of un-cited and technically unsubstantiated declarations is not acceptable in a technical document. For example, "In addition, diversions both in tributaries and in the Delta remove a significant proportion of total available water." (A-21). How much water, in what water year, is consumptively lost in the tributaries and how much is exported and is proposed for export by the BDCP? This unsubstantiated and apparently unanalyzed assertion is typical of the limited technical depth provided in this section. A substantive analysis would provide technical citations, the assumptions used in the model, the expected error range, and an actual analysis of the seepage-evaporation (carriage) losses from the current conveyance, and the modeled losses from the proposed project alternatives, and the proposed habitat acreage evaporation and transpiration (E/T).

Additionally, the conceptual figure (A-28) that apparently is the foundation for the entire analysis describes the only impact or driver on Adjusted Potential is Land Use. This is clearly incorrect and again uniformly unsupported by the science. It should state Water and Land Use for any credibility. Climate and geology drive the biogeographic potential, it is not independent. Marine influences are limited factors and then only for certain species, at certain life stages, not a driver for "Species and Biological Communities." Future potential is bi-directional, not uni-directional towards Adjusted, and no "enhancers" are described. Is the purpose of the diagram to illustrate

[5] Again identified by the ISA, NAS, and again by the Science Panel, the BDCP needs to detail why it is not using citations that would be expected by other professionals and defend why it is relies on certain selected conclusions over others.

that the BDCP would only have benefits that would improve conditions relative to current conditions? That is not supported by the data presented in the chapter.

The same clear bias in favor of the project is shown by the arrows depicted within that circle. For example, where are the process drivers identified by the NAS? Altered flow should include altered timing and volumes, and that radius should clearly include all of the "other stressors" that the BDCP has already identified.

III. Specific Comments on the Effects Analysis- Appendix B

The Effects Analysis itself demonstrated the foundational scie ntific problem with the BDCP: "*Entrainment of delta smelt at the south Delta export facilities may generally decrease under BDCP relative to existing biological conditions, although instances of increased entrainment are also possible*." [6] While the "study" was a black box analysis with no parameter or model initial conditions provided for independent review, the BDCP's own model result was that the BDCP may general decrease entrainment on Delta smelt or in fact increase it. This is unacceptable for a conservation measure.

The Effects Analysis also misstates the relative contribution to take of listed species by small agricultural intakes within the Delta . Scientific studies have consistently concluded that "small Delta agricultural diversions are likely to have a minor effect on pelagic (open water) fish, such as the [D]elta smelt."[7] As a result, larger diversions (such as those over 250 cfs), have been the focus for consideration of screening by the agencies responsible for fish . Thus, prioritization of tho se screening projects with the most potential to benefit target species is essential. The Effects Analysis is simply wrong in Section B.3.10 (actually described in B.4.4.3) to attribute significant take numbers to these small intake s without any supporting analysis or any technical rebuttal to existing scientific reports . Moreover, it is incorrect to assume that land conversion to other wetland types will not require continuing use of existing (or new intakes) , as creation of habitat will require significant water supplies.

As with Appendix A, the details of the model assumptions and scientific evidence that significant take is associated with small intakes are not provided. The point of this "analysis" appears to be a conflation of *Project* intake mortalit y on listed fish species with the well -studied and described insignificant impact from small Delta intakes. Equally concerning is the statement that a 16.6% reduction of intakes in the ROA could be removed for the purposes of habitat conversion (B.4.4.3.1). It is simply incorrect that the intakes of similar (unstated) size, with the "lowest magnitude" of impact and the "lowest certainty," with a suggested minimal population-level effect, should then be considered a significant cause of take by the BDCP. This pointless exercise typifies the scattershot approach taken in th e Effects Analysis. There are also significant problems with the both the description and the underlying concepts of Section B.0.1 Table B -2. The use of a symbol instead of the actual estimated percentages is unnecessarily confusing; this table should be

[6] http://www.deltacouncil.ca.gov/sites/default/files/documents/files/BDCP_Effects_Analysis_Review_Overview_of_Draft_Appendix_B_Entrainment.pdf

[7] Ecosystem Restoration Program, Ecosystem Strategy for Stage 2 Implementation Sacramento San Joaquin Delta Ecological Management Zone (July 21, 2010), available at: http://www.deltacouncil.ca.gov/sites/default/files/documents/files/ERP_Excerpts_for_3rd_Staff_Draft_Delta_Plan.pdf, citing Nobriga et al. (2005) available at: http://www.fws.gov/stockton/afrp/SWRCB/12.%20Nobriga%20et%20al.%202004.pdf.

revised to include actual percentages or ranges of percentages that apply to each item. The timing, extent and degree of South Delta and North Delta interoperation should also be described.
The assertion that the North Delta intake screening would function perfectly for the life of the permit is also unsubstantiated. A fine slot metal screen placed in the flow of a major river will get eroded by sediment drawn into the intakes, direct sediment impingement on the screen and that associated erosion and mechanical damage, and woody debris and human associated debris impact damage. That damage individually, and in aggregate, leads to increased impingement and reduced screening effectiveness. The reduced efficiency is difficult to detect and measure, and in practice only grossly damaged screens get replaced. Each of these points assumes that the intake was designed, installed, and operated correctly. That is often not the case. The "stacking" of each of these reductions of idealized efficiency must be calculated and analyzed, and not rely exclusively on favorable assumptions.

CONCLUSIONS

The fundamental premises of the BDCP analysis and the a-priori determination of the conservation measures must be re-examined. In particular, a detailed review of the ecological problems threatening fish, wildlife, and their associated habitats of the Delta and the relative effects of each of the potential conservation measures (individually and in aggregate) on each of those problems must be completed *before* conservation measures are selected. Appendices A and B fall far short of the level of analysis, transparency of basic model assumptions and conditions, and scientific foundation needed for a proposed project of this magnitude. As a result, the December 2012 Effects Analysis chapters should be re-written to address these concerns.